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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/782,092	02/18/2004	Timothy P. Mann	A42	4767
36378	7590	04/15/2008		
VMWARE, INC. DARRYL SMITH 3401 Hillview Ave. PALO ALTO, CA 94304			EXAMINER SAXENA, AKASH	
			ART UNIT 2128	PAPER NUMBER
			MAIL DATE 04/15/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/782,092

**Applicant(s)**

MANN, TIMOTHY P.

**Examiner**

AKASH SAXENA

**Art Unit**

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. Claims 1-29 have been presented for examination based on the application filed on 31<sup>st</sup> December 2007.
2. Amendment to the abstract and the title are entered as presented by applicant on 31<sup>st</sup> December 2007.
3. Amendment to the drawings (Fig.2 marked as prior art and replacement sheet) is entered.
4. Claims 2, 3, and 16 failed to present the claims in the manner indicated by section MPEP 608. Applicants have amended the claim and this objection is withdrawn.
5. Examiner withdraws the claim objection to claims 7 & 8, under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim, in view of applicant's amendment and arguments.
6. Claims 1-29 are rejected as presented and this action is made FINAL.

### ***Claim Interpretation***

7. Claim 1 is interpreted as:

The second plurality of timers are never used in the step of "generating", thereby, limitations pertaining to the second timers are moot. Further, the claim read like suspending a virtual machine and restoring the execution of same.

8. Claim 7 is interpreted as:

The read count value is time on the virtual timer between the preceding event and the next scheduled event.

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***Response to Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding Claim 1

Claim rejection relating to "would occur" is moot in view of amendment to claim.

Please see updated claim 1 rejection in view of amendment.

Regarding Claim 2 & 3

Examiner has stated in previous office action:

Claim 2 discloses limitation "the average rate of timer events in the virtual computer system is substantially the same as the average rate at which timer events would be generated in a physical computer system", where the limits or bounds of the "substantially" are unclear.

Applicant pointed to MPEP 2107.05(b) without support from the specification.

MPEP 2107.05 states:

WHEN A TERM OF DEGREE IS PRESENT, DETERMINE WHETHER A STANDARD IS DISCLOSED OR WHETHER ONE OF ORDINARY SKILL IN THE ART WOULD BE APPRISED OF THE SCOPE OF THE CLAIM

When a term of degree is presented in a claim, first a determination is to be made as to whether the specification provides some standard for measuring that degree. If it does not, a determination is made as to whether one of ordinary skill in the art, in view of the prior art and the status of the art, would be nevertheless reasonably apprised of the scope of the invention. Even if the specification uses the same term of degree as in the claim, a rejection may be proper if the scope of the term is not understood when read in light of the specification. While, as a general proposition, broadening modifiers are standard tools in claim drafting in order to avoid reliance on the doctrine of equivalents in infringement actions, when the scope of the claim is unclear a rejection under 35 U.S.C. 112, second paragraph, is proper. See *In re Wiggins*, 488 F. 2d 538, 541, 179 USPQ 421, 423 (CCPA 1973).

When relative terms are used in claims wherein the improvement over the prior art rests entirely upon size or weight of an element in a combination of elements, the adequacy of the disclosure of a standard is of greater criticality.

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Examiner respectfully disagrees with the applicant as no support from the specification is provided for the limitation "substantially". Please see updated claim 2 & 3 rejection in view of amendment.

For example: Having "substantially" in phrase "substantially behind", attempts to further define the how behind vaguely. However this definition being vague does not positively limit the claim.

Regarding Claim 4

Please see updated rejection below. Amendment to the claim is noted. Rejection for the phrase "substantially the same" is maintained.

Regarding Claim 5 & 6

Please see the rejection below. Applicant has not addressed the rejection adequately and has merely pointed to MPEP without clarification.

Regarding Claim 8-9

Rejection is moot in view of amendment. Please see updated rejection for claim 8.

Regarding Claim 11

Claim rejection relating to "would occur" is moot in view of amendment to claim.

Please see updated claim 11 rejection in view of amendment. Dependent claims are rejected likewise as well as they do not cure this deficiency.

Regarding Claim 16

Please see updated rejection below.

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Regarding Claim 17 & 18

Rejection is maintained for the same reasons as for claims 2 & 3 above. Please see updated rejection below.

Regarding Claim 19

Rejection is moot in view of amendment.

Regarding Claim 20

Claim 20 disclose limitation "substantially immediately" and is rejected as in claim 5. The degree or scope of "substantially immediately" cannot be ascertained from specification, Especially in presence of phrases like "predetermined amount", where "predetermined amount" can be "substantially immediately".

Regarding Claim 23

Rejection is moot in view of amendment.

Regarding Claim 24

Rejection is maintained. There are no bounds presented for "substantially". Having "substantially" in phrase "substantially behind", attempts to further define the how behind vaguely. However this definition being vague does not positively limit the claim.

Regarding Claim 25

Rejection is maintained for the same reasons as in claim 24.

Regarding Claim 27

Claim 27 disclose limitation "substantially immediately" and is rejected as in claim 5.

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10. Insufficient antecedent basis rejection for claim 8 is withdrawn in view of amendment.

***Claim Rejections - 35 USC § 112***<sup>1st</sup>

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 1-29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding Claims 1, 2, 3, 11, 16, 23 and 24

Independent claim 1, 2, 3, 11, 16, 23 and 24 disclose in preamble "the physical computer having *one or more timers* for keeping track of *a real time* for the physical computer". Although the specification & drawings disclose one timer as hardware clock, more than one such timers as claimed are not taught by the specification. Dependent claims do not address limitations with multiple real time timers as well. Hence claims 1-29 are rejected for above reason.

12. Claims 1-29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to

which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding Claim 1-29

Specifically, independent claims 1, 2, 3, 11, 16, 23 and 24 disclose multiple real time timers, however none of the limitation address how the virtual timers work with multiple real time timers. Further the specification does not disclose this interaction as well in Fig .3A-3B, where only 1 real time timer as "HW Clock 162" is disclosed. Hence the specification is not enabling for more than one real time timer.

***Claim Rejections - 35 USC § 112<sup>nd</sup>***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. Claims 1-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding Claim 1

Claim 1 discloses "the physical computer having one or more timers for keeping track of a real time for the physical computer", where as which physical real time timer is used with which virtual timer is not evident from the claim limitations.

For example, if there are more than one real time timers, the limitation

"determining when the first virtual timer is set to generate timer events according to the real time based on the programming information received from the guest software;"

Is indefinite as which timer is used for the "the real time" is unclear.



Regarding Claim 2-3

Claims 2 & 3 also suffer from the same deficiency as claim 1 as they have similar limitations as claim 1 above.

Further, in this case, timer events in virtual computer is happening at "substantially the same" as rate in physical computer system, implies an unclear range of the rate in which events can occur. The issue is not when-in-the-range itself the virtual even occurs, but the unspecified bounds of that range. e.g. physical events happening at every 5 millisecond (ms). Virtual events can happen every 4 ms (lower bound) – 5ms (upper bound), or 3 ms - 5 ms or other combination based on the time granularity that the specification may support. Hence neither a range is specified nor are there any sections of the specification presented to show this range make this rejection moot.

Further, the amended claim as now presented may also be read as that not all events happen at "substantially the same" rate.

Clarification leading to these distinctions in time rates and occurrences are essential to the claim as they claim the sequence of the events.

Claim 3 suffers from the same deficiencies as above and is rejected likewise.

Regarding Claim 4

Claim 4 is rejected for phrase "substantially the same" as in claim 2 and also for the use of the relative terminology.

Regarding Claim 5 & 6

Claim 6 discloses limitation, "substantially immediately". Examiner is uncertain as to what metes and bounds (& distinction) between executing the catch-up mode when the virtual timer falls behind the physical computer timer "substantially immediately" and "predetermined amount". The "predetermined amount" limitation is present in claim 5. Since the claims 5 & 6 are identical except one executes an action "substantially immediately" and other one after a "predetermined amount", a clear distinction is needed so that "predetermined amount" is not read same as "substantially immediately".

Regarding Claim 8

It is unclear how the proportionality of the read count value is determined between the real and virtual timers. An example with support in the specification will assist in clarification and withdrawal of this rejection.

Regarding Claim 11

Claim 11 discloses similar limitations as claim 1 and rejected as claim 1 above.

Regarding Claim 16

Claim 16 discloses similar limitations as claim 2&3 and rejected as claim 2&3 above.

Regarding Claim 17 & 18

Claims represent relative and unclear limitations like "substantially proportional", and "substantially the same" whose metes and bounds are not clear. Please see rejection for claim 5 & 6 as these claims are rejected likewise.

Regarding Claim 20

Claim 20 disclose limitation "substantially immediately" and is rejected as in claim 5. The degree or scope of "substantially immediately" cannot be ascertained from specification, Especially in presence of phrases like "predetermined amount", where "predetermined amount" can be "substantially immediately".

Regarding Claim 24

Rejection is maintained. There are no bounds presented for "substantially". Having "substantially" in phrase "substantially behind", attempts to further define the how behind vaguely. However this definition being vague does not positively limit the claim. Claim 24 discloses the limitations, "apparent time is substantially the same as real time" and "apparent time is substantially behind the real time". It is unclear what would be the metes and bounds of these limitation to select one from another.

Regarding Claim 25

Rejection is maintained for the same reasons as in claim 24.

Regarding Claim 27

Claim 27 disclose limitation "substantially immediately" and is rejected as in claim 5

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claim 1, 11-15 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,814,975 issued to Hirosawa et al in view of U.S. Patent No. 6,349,388 by Richard G. Russell (Russell hereafter)

Regarding Claim 1

Hirosawa teaches a method for emulating a plurality of virtual timers in a virtual computer system operating on a physical computer, the physical computer having one or more timers for keeping track of real time of the physical computer (Hirosawa: Fig.2).

Although Hirosawa teaches multiple virtual timers 540 for plurality of virtual machines 504 & 505, Hirosawa does not explicitly teach receiving programming information from the guest software for programming a first virtual timer. Russell also teaches a method for emulating a plurality of virtual timers in a virtual computer system, the virtual timers being programmable by guest software to generate a plurality of timer events (Russell: Abstract), the method comprising: receiving programming information from the guest software for programming a first virtual timer (Russell: Col.5 Lines 48—Col.6 Line 13; Fig.3); receiving programming information from the guest software for programming a second virtual timer (Russell:

Col.5 Lines 48—Col.6 Line 13; Fig.3); determining when the first virtual timer is set to generate timer events according to the real time, based on the programming information received from the guest software (Russell: Fig.3 Col. 3 Terminal time value where each row represents a timer); determining when the second virtual timer is set to generate timer events according to real time, based on the programming information received from the guest software (Russell: Fig.3 Col. 3 Terminal time value where each row represents a timer); and generating timer events for the first virtual timer and the second virtual timer in the same combined sequence that they would occur if the first and second virtual timers were implemented in a physical computer system (Russell: Col.5 Lines 42-47 Fig. 2 Element 210 being initiated).

Russell does not seem to explicitly teach wherein the generation of timer events fails behind the real time, so that a first so that a plurality of first timer events of the first virtual timer and one or more timer events of the second virtual timer, are set to have already occurred according to the real time, but the first plurality of events have not occurred in the virtual computer system.

Hirosawa teach wherein the generation of timer events fails behind the real time, so that a first so that a plurality of first timer events of the first virtual timer and one or more timer events of the second virtual timer, are set to have already occurred according to the real time, but the first plurality of events have not occurred in the virtual computer system as suspending the virtual machine where the virtual events would also stop according to the real time when the execution of the machine is suspended (Hirosawa: Col.12 Lines 58-Col.14 Lines 16).

It would have been obvious to one (e.g. a designer) of ordinary skill in the art at the time the invention was made to apply the teachings of Russell and Hirose to each other as both are analogous art in the field of virtual timer generation (Russell: Abstract; Hirose: Fig.2 Element 540), for execution of programs using those timers where Hirose uses these virtual timers to drive the virtual machines (Hirose: Fig.1) and Russell provides the added advantage to have these virtual timers programmable which would be advantageous to Hirose virtual machines which requires a different hardware architecture (Hirose: Abstract).

Regarding Claim 11

Claim 11 discloses similar limitations as claim 1 and is rejected for the same reasons. Claim 11 discloses a computer program embodied in a tangible medium, which is mapped to the timer state machine (program) and the associated timers embodied in a tangible medium (memory).

Regarding Claim 12 & 13

Claims 12 and 13 disclose performed using a timer event queue (Russell: Col.6 Lines 20-38).

Regarding Claim 14 & 15

Russell teaches timer event queue maintains a single time value for each of the plurality of virtual timers, representing a time at which the respective virtual timer should generate its next timer event as timer states in link list in the time-out order (or next timer event) (Russell: Col.6 Lines 20-38).

Regarding Claim 23

Russell teaches a method for coordinating a plurality of virtual timers in a virtual computer system, the virtual computer system operating within a physical computer system (Russell: Abstract), the method comprising: receiving programming information for each of the virtual timers, indicating when each of the virtual timers is to generate timer events; determining when each of the virtual timers would generate timer events if the virtual timers were implemented in a physical computer system (Russell: Col.5 Lines 48—Col.6 Line 13; Fig.3); and causing the virtual timers to generate timer events in the same combined sequence as if the virtual timers had been implemented in a physical computer system (Russell: Fig.3 Col. 3 Terminal time value where each row represents a timer; Russell: Col.5 Lines 42-47 Fig. 2 Element 210 being initiated).

***Allowable Subject Matter***

15. Claims 2-10, 16-22, and 24-29 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 1<sup>st</sup> and 2<sup>nd</sup> paragraphs, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).
16. Reasons for allowance are withheld until an amendment correcting the deficiencies under 35 USC 112 and formal matter is presented.

**Conclusion**

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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***Communication***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AKASH SAXENA whose telephone number is (571)272-8351. The examiner can normally be reached on 9:30 - 6:00 PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini S. Shah can be reached on (571)272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Akash Saxena/  
Examiner, Art Unit 2128

/Hugh Jones/  
Primary Examiner, Art Unit 2128